

Before I conclude this brief account, I would just mention that this artificial mode of hatching will apply equally to turkey's eggs. Several Europeans had put them into the ovens in Egypt, and a few did succeed in being hatched, but Arabs being totally ignorant of the principles of the oven-hatching, they subjected them to the same conditions as fowl's eggs—hence the failure of the greater number. But that they might be hatched artificially was evident from some of the eggs which were put in having been hatched. By this means the supply of turkeys would also be cheap and abundant.

I have no doubt that if this artificial hatching of turkeys as well as fowls were introduced into any country, and commonly adopted in farm houses, it would tend greatly to the advantage of the land.

References to the Plate.

Fig.

- 1st. General plan of the oven.
- 2d. Section of the corridor F G H I.
- 3d. Section of one cell in the direction of the corridor F G H I.
- 4th Section of one cell in the direction of the corridor A B C D.
- 5th. Floor of the upper story of one cell.
- 6th. Floor of the upper story of the cell Y.
- 7th. Floor of the under story of a cell.
- 8th. Floor of the under story of a cell after the 14th day.
- 9th Floor of the upper story of a cell after the 14th day.

ART. VII.—*Report on the Mortality among Officers and Men in H. M. Service in Bengal, and on the comparative salubrity of different Stations. By the late Dr. W. A. BURKE, Inspector-General of Hospitals.**

TO W. W. BIRD, ESQ.

President of the Committee for the Insurance of Lives in India.

SIR,

I have the honor to acknowledge the receipt of your letter, which a protracted and severe illness prevented my replying to as soon as I could have wished. I shall now endeavour as far as possible to comply with the request of the Committee in affording all the information in my power regarding mortality in the rank of officers as well as men

* For this very valuable paper we are indebted to Mr. Martin, the Surgeon to the Native Hospital of Calcutta. Dr. Burke's tabulated returns form an important addition to our knowledge of the laws of vital statistics. In connexion with this paper the reader should consult Mr. H. T. Prinsep's paper on the "Value of Life in the Civil Service."—*Journal of the Asiatic Society*, 1832, p. 277, and 1837, p. 341; and his "Table of Mortality," founded on the registers of the Lower Orphan School, 1838, p. 818.—ED.

FIG 5th

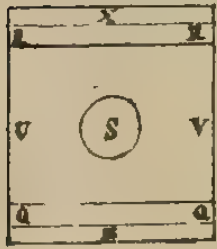


FIG. 6th

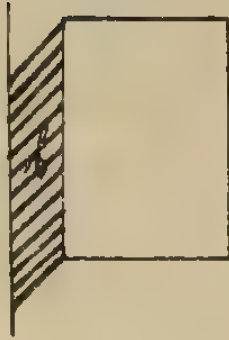


FIG. 7th

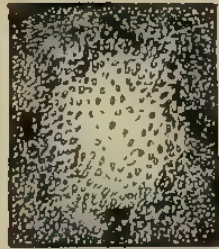


FIG 8th



FIG. 9th

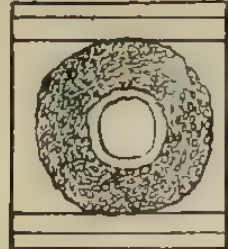


FIG. 2^d

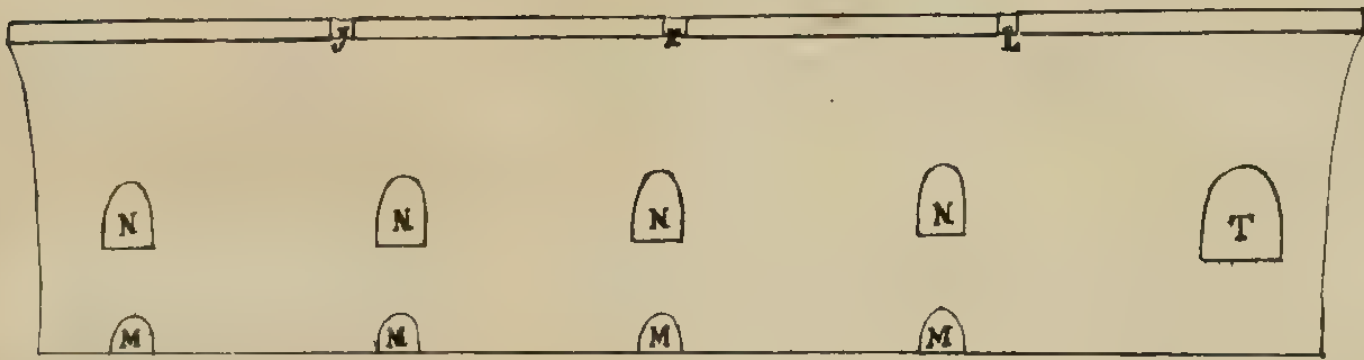


FIG. 3^o

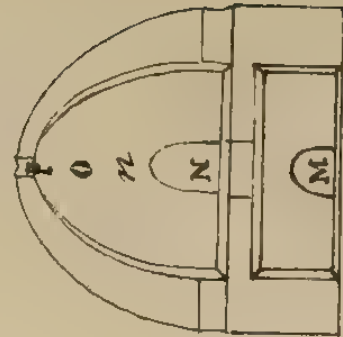


FIG. 4th

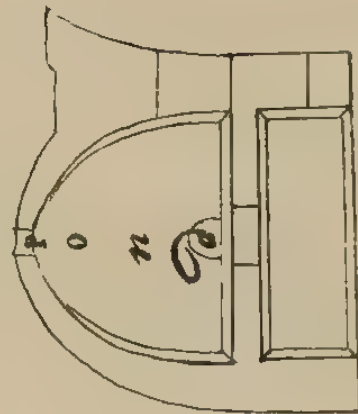
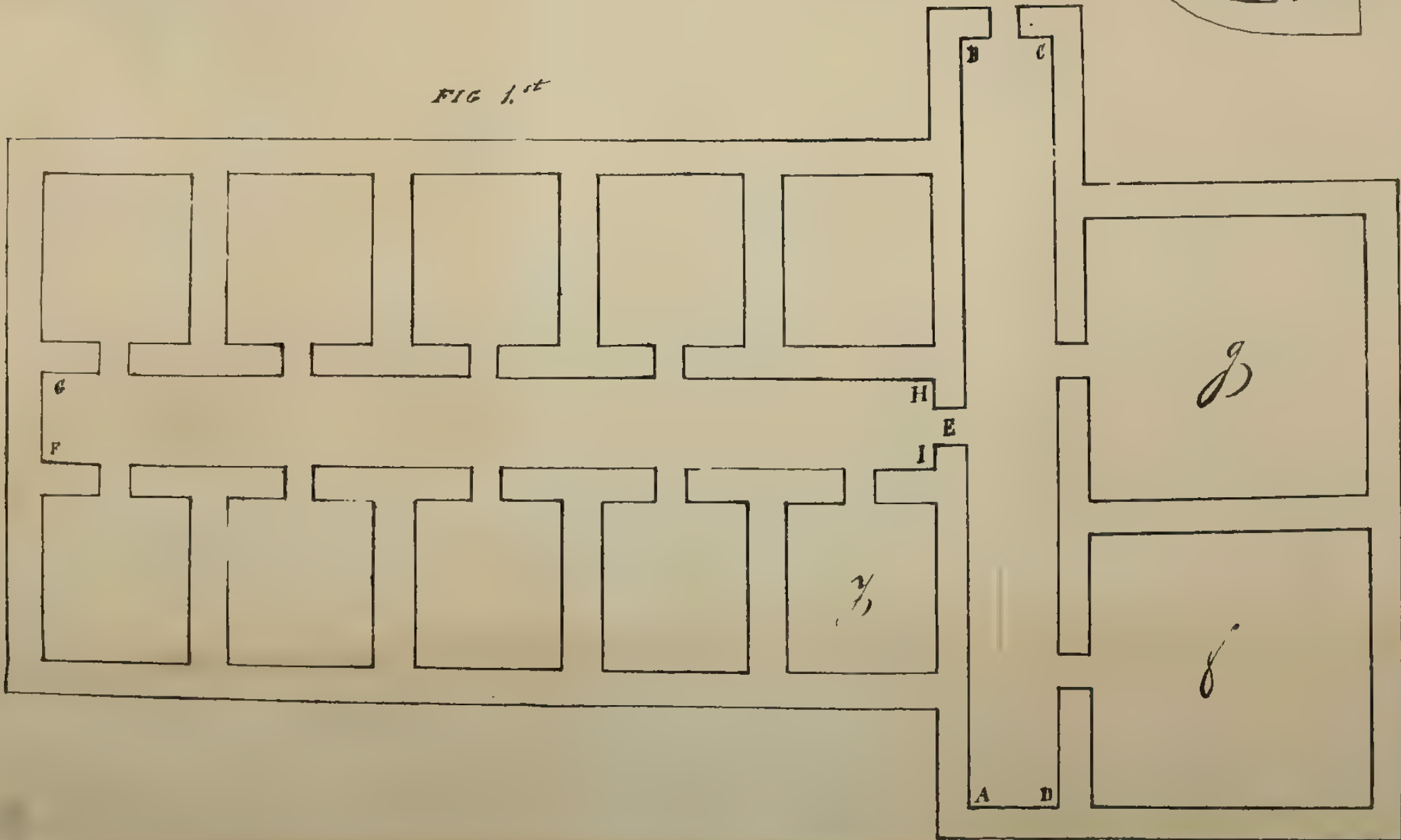


FIG 1st



Non french feet of 3 jet 1 inch and 1 1/2 line to the metre.

in His Majesty's service in Bengal, and the comparative salubrity or otherwise of the different Stations for European Troops in this command.

As to the healthiness of the Stations occupied by H. Majesty's Troops in Bengal, the following abstract from their Sick Returns will serve so far, to afford the requisite information for a period of four years, as to their comparative degree of health from 1830 to 1833 inclusive.

STATIONS.	Period of years,	Officers.			Men.			Women.			Children.		
		Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.	Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.	Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.	Average Strength,	Died of diseases in the Station,	Proportion of Deaths to Strength per cent.
Meerut,	4	222	3	1.35	5,900	117	1.98	722	16	2.21	1,200	59	4.91
Cawnpore, ..	4	226	7	3.10	5,950	271	4.55	914	37	4.04	1,572	145	9.22
Ghazee pore, ..	4	109	3	2.75	3,754	143	3.80	456	15	3.29	845	56	6.62
Berhampore, ..	4	118	9	7.62	3,515	236	6.77	473	27	5.71	865	70	8.09
Chinsurah, ...	4	119	6	5.04	2,523	154	6.10	469	28	5.96	756	28	3.70
Fort William,	4	119	7	5.88	3,097	235	7.59	447	48	10.73	761	124	16.29
Kurnaul, .. .	3	81	1	1.23	2,827	85	3.00	404	7	1.73	679	45	6.62
Agra,	2	63	..	..	1,513	29	1.91	208	3	1.45	336	30	8.92
Dinapore, .. .	2	56	1	1.79	1,612	56	3.84	189	8	4.23	299	37	12.37
Boglipore, ..	1	27	..	..	1,037	41	3.95	119	6	5.05	190	16	8.42
Chirra Poonjee,	1	..	..	..	38	6	15.79	..	..	..	..	..	..
Landour, .. .	4	..	..	..	275	16	5.82	..	..	..	..	..	..
Total, .. . .	..	..	..	..	32,041	1,389	4.33	4,401	195	4.43	7,503	610	8.30

Among the Officers there were ten more deaths, but none of which occurred in any of the above Stations, viz.—

At Sea	2
On the River	3
At Madras	1
At Sultanpore Benares	1
At Allahabad	1
On the Hills	2

Giving the following proportions of deaths among the Officers His Majesty's service for four years, from 1830 to 1833 inclusive—

Total	Total	Total ratio of
Average strength	Deaths.	deaths to strength.
1140	47	412

Among the Men also there were other deaths, not within the scope of the foregoing Statement ; in consequence of which an abstract is give to include the whole of the casualties regimentally among all His Majesty's Troops throughout the Bengal command, for the period 1830 to 1833.

REGIMENTS.	Period of years.	Strength of Command, 1st January each year.	By disease in Regimental Hospitals.	By accidents, drowned, killed, &c.	Absent Deaths.	Grand Total of Deaths.	Proportion of Deaths to Strength per cent.	Invalided.	Remarks.
11th Lt. Dragoons, ..	4	2,626	75	2	15	92	3.50	18	In the Column 'absent Deaths,' are included, Deaths absent from Regiment in General and Detachment Hospitals, and other Casualties, such as died or drowned at sea, &c.
16th Lancers,	4	2,488	121	12	16	149	5.83	36	
3d. Buffs,	4	3,138	185	13	7	205	6.53	4	
13th Lt. Infantry, ..	4	3,217	87	6	4	97	3.01	13	
14th Foot,	1-1	1,350	58	6	3	67	4.96	0	
16th Ditto,	4	3,047	199	7	9	215	7.05	20	
26th Ditto,	4	3,447	53	3	24	80	2.32	10	
31st Ditto,	4	3,925	100	18	18	136	3.72	8	
38th Ditto,	4	3,927	146	20	22	188	4.78	4	
44th Ditto,	4	3,510	135	9	5	149	4.24	11	
49th Ditto,	4	2,909	110	11	2	223	7.66	8	
Total,	0	33,485	1,369	107	125	1,601	4.78	133	

Shewing the strength and deaths, and the ratio of deaths to strength, in His Majesty's Regiments, in the Bengal command.

	Total Average strength.	Total Deaths.	Total ratio of deaths to strength per cent.
Men,	33484	1601	4.78.

It is to be observed that the strength of the troops in this statement is as given in the Regimental Returns on the 1st January of each year, and which differs from the mean annual strength ; the latter being 32041, the ratio of total deaths to it is 4.99. In the different Stations of His Majesty's Regiments in the Presidency of Bengal, there is so little difference in the periods and duration of the seasons, as well as in their general temperature and climate, that it is upon the innate features of each Station itself, and from the data afforded by

its Returns, that its comparative salubrity would appear to be best deduced.

The steadiness or mutability of the climate, or considerable anomalies of weather, or physical properties, seem more to influence the health of the troops than either its heat or its cold, abstractedly considered.

The causes of sickness in many Stations must be traced to other sources than climate.

The soil of Bengal being composed of alluvial matter, formed by the detritus carried down by the great rivers, and accumulated for ages, there is a poison in the exhalations of such soils, the nature of which is unknown; but from it emanate all those species and varieties of fevers, (dependent on marsh miasma as their remote cause) so frequent in Bengal, and to which one general character appertains—periodicity, or remissions, and exacerbations.

A large proportion however of the cases of sickness and deaths among the European soldiers, may be more or less attributed to excesses, especially in the use of spirituous liquors.

The relative healthiness of each Station is according to the Returns, as follows, from 1830 to 1833 inclusive—

	Deaths to strength.
Fort William	7·59 per cent.
Berhampore	6·77
Chinsurah	6·10
Cawnpore	4·55
Boglipore.....	3·95
Dinapore	3·84
Ghazeepore	3·80
Kurnal	3·00
Meerut	1·98
Agra	1·91

There are given Classification Tables, taken from the Regimental Returns, shewing the different classes, numbers, ages, and deaths, of the soldiers of His Majesty's service in Bengal for the years 1826 to 1833, viz.

Return of the different Classes of Men, Ages and Deaths of H. Majesty's Troops serving in the Bengal Command.

1826.

Class.	Age.		Proportion of Deaths to Strength per cent.
	Number.	Died.	
11th Light Dragoons, from Bhurtpore.	21	0	Total.
	98	4	
16th Light Dragoons, Lanciers, from Bhurtpore.	0	6	87th Foot, from Ava.
	6	67	
13th Light Infantry, from Ava.	111	0	59th Foot, from Bhurtpore.
	388	6	
14th Foot, from Bhurtpore.	64	41	47th Foot, from Ava.
	26	148	
31st Foot, from England.	102	60	44th Foot, from Ava.
	516	46	
38th Foot, from Ava.	91	174	59th Foot, from Bhurtpore.
	21	35	
44th Foot, from Ava.	196	56	47th Foot, from Ava.
	263	14	
47th Foot, from Ava.	144	144	59th Foot, from Bhurtpore.
	46	267	
59th Foot, from Bhurtpore.	22	231	47th Foot, from Ava.
	28	217	
72th Foot, from Ava.	31	29	59th Foot, from Bhurtpore.
	72	218	
87th Foot, from Ava.	7	34	47th Foot, from Ava.
	7	34	
Total.	1,015	273	47th Foot, from Ava.
	1,649	273	
11th Light Infantry, from Ava.	262	262	59th Foot, from Bhurtpore.
	273	273	
14th Foot, from Bhurtpore.	268	262	47th Foot, from Ava.
	273	273	
16th Light Dragoons, Lanciers, from Bhurtpore.	273	273	59th Foot, from Bhurtpore.
	273	273	
19th Light Dragoons, from Bhurtpore.	273	273	47th Foot, from Ava.
	273	273	
25th to 30th	150	15	59th Foot, from Bhurtpore.
	150	15	
20th to 25th	98	4	47th Foot, from Ava.
	98	4	
25th to 30th	150	15	59th Foot, from Bhurtpore.
	150	15	
30th to 35th	173	15	47th Foot, from Ava.
	173	15	
35th to 45th	113	12	59th Foot, from Bhurtpore.
	113	12	
Under 18 years, ..	12	0	47th Foot, from Ava.
	12	0	
Unknown, ..	0	0	59th Foot, from Bhurtpore.
	0	0	

1826 being the first year these Returns were required, the term "unknown," was applied to those men whose ages the Surgeons could not then ascertain, but afterwards, when ascertained, they were taken into their proper and respective classes.

1827.

CLASS.	Age.	11th Light Dragoons.		16th Light Dragoons		3d. Foot or Buffs.		13th Light Infantry.		14th Foot.		31st Foot.		38th Foot.		44th Foot.		47th Foot.		59th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years,		20	2	5	0	46	12	137	24	22	8	114	12	99	23	198	11	94	6	189	10	924	108	11.69
" 20 to 25 "		134	8	66	16	184	29	464	35	141	8	435	20	297	29	425	21	362	24	326	8	1,581	178	11.25
" 25 to 30 "		117	10	123	10	86	28	197	13	165	13	262	10	184	27	223	10	255	19	199	11	1,811	151	8.34
" 30 to 35 "		168	11	260	12	77	16	88	3	272	15	87	6	211	12	175	5	113	14	130	5	2,834	99	3.49
" 35 to 45 "		144	4	166	6	84	18	58	4	247	19	81	9	122	20	114	1	74	12	104	7	1,194	100	8.37
Under 18 years, ..		16	0	1	0	0	0	14	0	8	0	13	0	21	0	37	0	13	0	29	0	152	0	0
Unknown,		1	0	20	0	0	0	0	0	0	0	0	0	0	0	32	0	0	0	0	0	53	0	0

1828.

CLASS.	Age.	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Buffs.		13th Light Infantry.		14th Foot.		31st Foot.		38th Foot.		44th Foot.		47th Foot.		59th Foot.		Total.		Proportion of Deaths to Strength per cent.
		Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
	From 18 to 20 years.	16	2	2	0	52	5	35	16	19	3	62	4	86	8	98	6	88	2	181	4	639	50	7.82
	" 20 to 25 "	140	25	90	10	282	25	469	35	167	10	512	18	299	27	486	23	363	16	298	21	3,106	210	6.76
	" 25 to 30 "	124	15	93	8	133	19	200	27	155	7	285	22	180	20	213	8	243	25	178	11	1,804	162	8.98
	" 30 to 35 "	149	11	168	17	112	26	108	7	251	12	81	7	146	3	164	4	105	8	124	4	1,408	99	7.03
	" 35 to 45 "	159	11	217	11	120	19	57	11	261	28	89	10	129	13	117	3	67	7	97	5	1,313	118	8.98
	Under 18 years. . .	17	0	6	0	3	0	19	0	4	0	8	0	13	0	17	0	13	0	21	0	121	0	0
	Unknown, . . .	0	0	0	0	49	0	0	0	0	0	5	0	0	0	23	0	0	0	0	0	77	0	0

1829.

CLASS.	11th Light Dragoons.		16th Light Dragoons Lancers.		3d. Foot or Bufs.		13th Light Infantry.		14th Foot.		16th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to Strength per cent.
	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years.	5	2	2	2	53	7	13	9	3	0	22	9	3	2	48	0	22	4	39	3	210	38	18-09
„ 20 to 25 „	122	12	148	41	390	26	413	50	140	5	98	16	535	24	386	20	497	15	199	14	2,927	223	7-62
„ 25 to 30 „	140	9	107	5	129	28	202	32	150	7	127	18	329	10	236	13	193	8	200	26	1,813	156	8-60
„ 30 to 35 „	146	5	123	4	142	6	118	10	256	5	169	6	84	3	129	6	153	4	188	35	1,508	84	5-57
„ 35 to 40 „	150	8	214	14	153	6	52	8	271	19	405	9	90	2	137	8	131	2	87	29	1,490	105	7-04
Under 18 years, ..	16	0	12	0	9	0	19	0	5	0	10	0	14	0	6	0	14	0	7	0	112	0	0
Unknown,	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	18	0	0	0	20	0	0

1839.]

Dr. Burke's Reports.

55

1830.

CLASS.	11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Buffs.		13th Light Infantry.		14th Foot.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to Strength per cent.
	Age.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.		Died.
From 18 to 20 years.	60	0	2	17	1	166	0	159	0	28	1	38	1	12	0	55	0	400	0	12	1	972	6	0.62	
" 20 to 22 "	81	2	5	82	5	165	2	0	5	111	3	132	1	131	3	114	8	0	7	204	6	1,052	47	4.47	
" 22 to 24 "	120	6	1	195	8	131	8	0	6	119	9	224	0	149	4	256	9	0	8	109	8	1,427	67	4.69	
" 25 to 30 "	191	5	2	298	16	144	12	0	10	207	18	306	7	475	10	353	10	412	11	155	22	2,668	123	4.60	
" 30 to 35 "	142	5	5	149	9	120	2	382	35	145	16	110	1	130	3	135	6	97	6	246	10	1,770	98	5.53	
" 35 to 45 "	50	5	11	131	2	68	2	87	7	207	17	94	6	132	0	152	8	39	5	44	3	1,225	66	5.38	

1831.

CLASS.	Age		11th Light Dragoons.		16th Light Dragoons.		3d. Foot or Buffs.		13th Light Infantry.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to Strength per cent.
	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
	24	0	4	1	13	0	165	0	14	0	98	0	1	0	27	0	360	0	16	0	722	1	0.14		
	62	3	9	2	27	4	194	3	136	1	103	2	92	1	175	1	0	2	40	3	838	22	2.62		
	129	4	89	2	124	11	131	8	119	15	183	6	111	4	214	11	0	19	45	6	1,145	86	7.51		
	182	12	208	4	361	23	156	19	206	15	399	10	492	19	272	21	379	5	371	31	3,026	159	5.25		
	150	4	93	6	161	7	80	6	111	11	33	4	146	6	154	8	114	7	222	17	1,264	76	6.01		
	55	12	225	10	136	11	74	3	208	12	62	3	140	4	160	13	36	6	58	10	1,154	84	7.28		
	0	0	23	0	0	0	0	0	0	0	0	0	9	0	14	0	5	0	0	0	51	0	0		
	0	

Class.	Age.		Proportion of Deaths to strength per Cent.
	From 18 to 20 years.	Under 18 years. ..	
11th Light Dragoons.	Number.	13	1.04
	Died.	1	5
16th Light Dragoons.	Number.	15	1.482
	Died.	0	1
3d Light Lancers.	Number.	9	1.04
	Died.	0	0
5d Foot or Buffs.	Number.	33	1.11
	Died.	1	8
13th Light Infantry.	Number.	141	1.04
	Died.	0	5
16th Foot.	Number.	4	1.04
	Died.	1	8
26th Foot.	Number.	7	1.04
	Died.	0	1
31st Foot.	Number.	94	1.04
	Died.	0	0
38th Foot.	Number.	5	1.04
	Died.	1	1
44th Foot.	Number.	178	1.04
	Died.	1	1
49th Foot.	Number.	16	1.04
	Died.	1	1
Total.	Number.	482	1.04
	Died.	1	5
11th Light Dragoons.	Number.	155	1.11
	Died.	1	8
16th Light Dragoons.	Number.	35	1.11
	Died.	1	0
3d Light Lancers.	Number.	155	1.11
	Died.	1	0
5d Foot or Buffs.	Number.	155	1.11
	Died.	1	0
13th Light Infantry.	Number.	155	1.11
	Died.	1	0
16th Foot.	Number.	155	1.11
	Died.	1	0
26th Foot.	Number.	155	1.11
	Died.	1	0
31st Foot.	Number.	155	1.11
	Died.	1	0
38th Foot.	Number.	155	1.11
	Died.	1	0
44th Foot.	Number.	155	1.11
	Died.	1	0
49th Foot.	Number.	155	1.11
	Died.	1	0
Total.	Number.	155	1.11
	Died.	1	0
From 18 to 20 years.	Number.	13	1.04
	Died.	1	5
" 20 to 22 "	Number.	35	1.11
	Died.	1	0
" 22 to 24 "	Number.	155	1.11
	Died.	1	0
" 25 to 30 "	Number.	238	1.53
	Died.	4	19
" 30 to 35 "	Number.	161	1.06
	Died.	2	10
" 35 to 45 "	Number.	26	1.06
	Died.	12	6
Under 18 years. ..	Number.	3	0
	Died.	0	0

CLASS.	11th Light Dragoons.		16th Light Dragoons Lancers.		3d Foot or Bufs.		13th Light Infantry.		16th Foot.		26th Foot.		31st Foot.		38th Foot.		44th Foot.		49th Foot.		Total.		Proportion of Deaths to strength per Cent.
	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	Number.	Died.	
From 18 to 20 years.	15	0	10	0	107	1	146	1	4	0	6	0	13	0	5	0	73	0	16	0	395	2	0.50
„ 20 to 22 „	112	1	20	3	98	0	173	0	10	0	12	1	11	0	111	0	218	1	20	0	785	6	0.76
„ 22 to 24 „	64	0	49	10	82	2	131	0	90	1	81	1	9	1	93	0	204	2	63	6	866	23	2.65
„ 25 to 30 „	123	3	206	25	99	20	135	13	209	22	389	11	676	19	298	25	126	24	260	22	2512	184	7.32
„ 30 to 35 „	133	1	82	4	195	8	76	3	138	9	164	1	147	3	175	16	121	8	183	23	1414	76	5.37
„ 35 to 45 „	179	8	191	30	113	5	70	4	217	15	115	3	39	9	200	16	61	10	103	13	1288	113	8.77
Under 18 years. ..	3	0	10	0	7	0	9	0	14	0	7	0	10	0	9	0	4	0	0	0	73	0	0

General Abstract of the foregoing Returns, giving the Ratio of Deaths of each class for 8 years.

CLASS.	1830.	1831.	1832.	1833.	Average proportion from 1830 to 1833.	1826.	1827.	1828.	1829.	Average proportion from 1826 to 1829.	Mean average proportion for 8 years.
From 18 to 20 years.	0·62	0·14	1·04	0·50	0·58	26·89	11·69	7·82	18·09	16·12	8·35
„ 20 to 25 „	4·58	5·07	2·39	1·71	3·44	11·69	1·125	6·76	7·62	9·33	6·39
„ 25 to 30 „	4·60	5·25	6·27	7·32	5·86	14·61	8·34	8·98	8·60	10·13	8·25
„ 30 to 35 „	5·53	6·01	3·99	5·37	5·22	11·58	3·49	7·03	5·57	6·92	6·07
„ 35 to 45 „	5·38	7·28	5·71	8·77	6·78	13·76	8·37	8·98	7·04	9·54	8·16

The General Abstract of the foregoing shews that for the four first years, viz. 1826-27-28 and 29 the ratio of deaths is,

From the age of 18 to 20 years 16·12 per cent.

„	20 to 25	„	9·33	„
„	25 to 30	„	10·13	„
„	30 to 35	„	6·92	„
„	35 to 45	„	9·54	„

For the four last years, viz. 1830-31-32 and 33, the ratio of deaths is,

From the age of 18 to 20 years 0·58 per cent.

„	20 to 22	„	2·24	} 3·44
„	22 to 24	„	4·63	
„	25 to 30	„	5·86	
„	30 to 35	„	5·22	
„	35 to 45	„	6·78	

There will be observed a striking difference between the ratio of deaths in each class of the two periods of four years; viz. first, from 1826 to 1829, and, second, from 1830 inclusive. But there is to be taken into consideration, that in the first period there are included the casualties (in 1826) of the Troops His Majesty's service who had been in active service at Bhurtpore, Ava, and Arrakan. During the campaigns, in the latter places especially, the deaths from disease among the young soldiers recently arrived in India, was very great.

Thus in the 13th Regiment Light Infantry, that had arrived in India in May 1823, and was composed chiefly of young soldiers, the mortality was,

	Strength.	Deaths.	Proportion.
At Bengal from May } to December, 1823 }	653	45	6·89 for 8 months
At Ava in... .. 1824	608	231	37·99
Do. do. 1825	377	115	30·50

In the 38th Regiment, which arrived in Bengal in May 1823, the mortality was,

	Strength.	Deaths.	Proportion.
In 1822 in Bengal	743	94	12·65 per cent.
In 1823 do.	695	52	7·48
In 1824 in Ava	643	185	28·77
In 1825 do.	458	162	35·37

In the 44th Regiment, which arrived from England in November 1822, the mortality was,

	Strength.	Deaths.	Proportion.
In 1823 in Bengal	661	73	11·43 per cent.
In 1824 at Chittagong } and Arrakan }	588	88	14·96
In 1825 at Arrakan	500	203	40·60

There is a difference however in the mortality of young recruits of Regiments when on active service, and the contrary ; as, for example, in the 13th Light Infantry, which in 1826 in Bengal was joined by 600 recruits, of whom there died in that year 79, being a proportion of 13·16 per cent in Bengal.

His Majesty's 31st Regiment arrived in Bengal in June 1825, and was joined in that year by 500 recruits, of whom there died 65, a proportion of 11 per cent, in Bengal.

The volunteers are generally men from the age of 30 to 35, in which class the ratio of deaths from 1826 to 1829 (including a period of active service) was 6·92, while during the same period, the ratio in the class from 18 to 20 years was 16·12 per cent.

Besides the sending from England of lads too young for the service in India, there was another important circumstance as affecting their health, which was that of their having been sent out at improper periods ; for they arrived in Bengal at the hot and rainy seasons, found to be more especially obnoxious to the lad or boy recruits ; and of such, unfortunately, was the chief part of those sent out in 1826 to 1829, as well as before.

From the difference of habits of military and civil life, young soldiers are in every climate peculiarly liable to disease, and *cæteris paribus* the younger the more susceptible to feel the change ; and this change has a direct tendency to induce a highly inflammatory diathesis, leading to such explosions of disease as witnessed here among the recruits. The tendency to disease exists it is true in all seasons in India in the young and plethoric, but it is in the hot and rainy seasons, and particularly at the commencement and termination of the rains, that endemial diseases are most dangerous, and fatal ; yet this was the very time at which these recruits principally arrived in Bengal.

I took the earliest opportunity, and seized every occasion, to make the strongest representations on these important subjects, and of sending out soldiers for His Majesty's service to India at *proper*

age, and *season*; and there are on record my memorials on these subjects to the Commander-in-Chief in India, and to the Medical Department in England—of December 23d, 1826; May 31st, 1827; 6th January, 1828; and December, 1829—and upon which the Home authorities at last acted. In these memorials it was represented by me,

1st. That the soldier should arrive in India at the *age* and *period* when he can be of the greatest use when called upon for actual service. That age to be 24 or 26, or full grown manhood, as most favourable to health, and least so to disease in India.

2nd. That recruits and soldiers should be embarked in England, so as to arrive in Bengal at the commencement of the cool season, when they might be *marched* to their several Stations up the country, instead of *proceeding* by the river.

These memorials I accompanied with various statements; such as those in this communication, in proof of the great comparative mortality among the lad recruits particularly; as also the comparative mortality between the soldiers arriving in Bengal in the hot and in the cool season, as by the following abstract of statements from December 1825, to July 1829, of casualties of detachments His Majesty's service, arriving in Bengal from England, being,

In the cold season, per cent,	0·75
In the hot season,	3·0
Proceeding by water to join their corps,	6·50
On marching to join their corps,	0·50
Average of casualties on the voyage out,	1·50
Average of casualties from the date of arrival in Bengal } to joining their corps,	6·75
Ditto of casualties of the whole of the detachments } from their leaving England to join their corps in } Bengal,	8·0

The accompanying Returns* elucidate these subjects still further, shewing the state of each Regiment His Majesty's service, their strength, the numbers who joined, and that died, from the date of their arrival in the Bengal command to the 31st December last.

On consulting the monthly admissions in the returns of sick, an abstract from which is given on the other side, the number of cases of disease (and they are particularly of the acute kind) and casualties, will be observed to correspond in a most remarkable manner with the range of the thermometer, especially at the Stations in Upper India; and so great is the difference between the cold season and the

* The Returns alluded to, will form an appendix to the next Number.—ED.

hot, that a partial illustration is afforded of the influence of climate which sets all theory on the subject at defiance.

Among the soldiers exposed to the same degree of heat, the influence of the ingesta seems to be more powerfully injurious to the constitution than climate. There is a marked difference in the ratio of sick and casualties between the Cavalry and Infantry Regiments, stationed in the same cantonments, of His Majesty's service in India, in favour of the latter. In the Cavalry the soldier's pay is greater, and among them a superabundance of stimulant food and drink keeps so great a number in an almost perpetual state of proximity to inflammatory diseases.

During the cold months the men continually expose themselves, especially in the Upper Stations, to the direct rays of the sun, which is a great cause of disease, even when all accumulation of heat is prevented by the coolness of the breeze, for then the infringing of the direct rays of the sun upon an opaque body causes a greater increase of temperature than is observable by a thermometer.

Abstract from the Monthly Returns of Sick shewing the proportion of the average daily sick, and of deaths to strength per cent for four years.

Months,	Proportion of the average daily sick to strength per cent.				Total proportion of the average daily sick to strength per cent.	Proportion of deaths to strength per cent.				Total proportion of deaths to strength per cent.
	1830	1831	1832	1833		1830	1831	1832	1833	
January, ..	7.12	5.94	6.33	5.45	6.21	26	23	31	15	24
February,	7.58	5.85	5.96	5.52	6.23	20	10	12	18	15
March, ..	8.64	5.80	6.10	5.89	6.61	18	19	15	15	17
April,	9.24	7.14	6.88	6.22	7.37	28	19	17	15	20
May,	9.75	8.47	7.88	6.78	8.22	20	44	25	25	29
June,	9.34	8.47	7.36	7.19	8.09	31	37	32	37	34
July,	9.14	8.36	7.61	7.72	8.21	30	44	34	74	46
August....	9.49	9.10	7.74	8.29	8.65	34	47	35	74	48
September,	10.71	8.32	8.03	9.79	9.21	71	46	43	1.15	69
October, ..	8.92	8.12	8.20	8.29	8.36	47	64	52	30	48
November,	8.16	7.18	7.05	7.79	7.54	51	60	43	35	47
December,	6.77	7.06	6.23	7.40	6.86	33	22	32	44	33
Total,	8.72	7.48	7.11	7.18	7.62	4.15	4.39	3.73	4.98	4.31

The sick at Landour and Chirra Poongee are not included in the above.

By the returns for four years, the minimum of sickness and deaths occurs in February. January and it are the driest months. The maximum of sickness and deaths occurs in September; being the cessation of the rains, when the exhalations have brought the surface to the consistence of mud—a state that appears especially to generate the miasmata producing fevers, &c.

Berhampore.

With respect to the localities of the Stations “as affecting their salubrity or otherwise,” as required by the Committee, I have in reference to the return of the sick, &c. at the several Stations, given at the commencement, further to add, that at the Station of Berhampore, the Barracks are so placed, that one particularly is close to a large stagnant tank, into which the sewers of the Barracks and necessaries, &c. empty themselves, so that in the dry and hot season especially, the men are enveloped in the stench from it. That the influence of its exhalations spreads far, I have no doubt. The malaria from it, as well as numerous other sources, is of course the active cause of much of the mischief that infests the Station of Berhampore.

For the period of four years, from 1830 to 1833, inclusive, the average proportions of deaths to strength per cent was, *at Berhampore,*

Officers	7·62 per cent per annum.
Men	6·77
Women	5·71
Children	8·09

Cholera prevailed epidemically in Berhampore in 1829 and 1830, and commenced in the temporary sheds recently erected, (not far from the great tank before mentioned) for part of His Majesty's troops; after which it appeared in the women's quarters—a low one-storied brick-building; afterwards on the ground story; and then in the upper story of the Barracks next the great tank, &c.

Fort William.

In the Station of Fort William, in the Barracks generally occupied by His Majesty's troops, the apartments for the men are deficient in height and ventilation. The buildings are too crowded together. The estimate of space, and of domestic convenience, has been too confined for the climate.

From the crowding of the buildings, and height and proximity of the fortifications, the radiation of heat is not only very great, but there is prevented the dissipation of those malarious vapours of which there appears to be so copious a supply from various sources in Fort William.

One of the consequences of all these is, in the warm season especially, the men feel so oppressed at night that they leave their rooms and expose themselves to all the causes and bad effects of suppressed transpiration.

The average ratio of mortality in His Majesty's troops quartered in Fort William is as follows, for four years from 1830 to 1833—

Officers	5·88 per cent per annum.
Men	7·59
Women	10·73
Children	16·29

Fort William is one of the worst, if not the very worst, of the Military Stations in India for children.

Cawnpore.

In the Station of Cawnpore for the period of four years, from 1830 to 1833, the average proportion of deaths to strength is,

Officers	3·10 per cent per annum.
Men.....	4·55
Women	4·04
Children	9·22

As to the locality of this cantonment, none of the Barrack buildings come close to the river, excepting the Hospital in which the sick of the King's Regiment of Infantry are treated. The soil rests on a substratum of Kunkur, which is favourable to the dryness of the Station. The declivity of the site secures it against any accumulation of moisture; the drainage is also facilitated by several small ravines or gullies, which intersect the cantonment, each of which during the rainy season becomes a streamlet; thus the water does not lodge, but runs quickly off into the river (above which all the Barracks are sufficiently elevated) or it is speedily absorbed, so that the wet season at Cawnpore is generally found pleasanter than in many other Stations in Upper or Central India.

The site of the Barracks of His Majesty's Infantry Regiment is pretty high, that of the King's Cavalry Regiment not so high; but that of all however is sufficiently elevated to allow of the water passing off.

The ground in the rear of the King's Infantry Regiment's Barracks is broken in many places, by the violence of the periodical rains, into deep fissures and ravines, containing numerous cavities, which, however individually small, may form in the aggregate a consider-

able deposit of stagnant water, which before its final evaporation cannot fail to be an agent more or less active in the generation of miasmata.

In the Barracks for the European troops here, the plans adopted by the architect would appear to have arisen from the idea of a Regiment standing in open column of companies, which however ingenious in a military point of view, is rather objectionable in a medical one, as it makes one building a screen to another, and thus opposes perfect perflation, an object of paramount importance where masses of men are to be congregated together, and where a perpetual current of air becomes the grand neutralizer of insalubrious miasmata.

The prevailing winds are from the west and east, varying to the north or south. If the buildings were placed in echelon this might be prevented.

Meerut.

In the Station of Meerut the locality is in Meerut deemed good. There are a few jheels and swamps in the vicinity ; but not near, or considerable enough to have much effect on the health of the troops. The country around is flat ; the soil is sandy, with a slight declination to south sufficient to carry off the heavy rains into the Kallee Nuddy to the eastward.

Notwithstanding the northern latitude of Meerut, considerably without the tropics, and in the third climate, the heat is intense in the dry and hot season, and tropical diseases are prevalent during the hot and rainy seasons. For the period of four years, from 1830 to 1833, the average proportion of deaths to strength is, at Meerut,

Officers	1·35 per cent per annum.
Men.....	1·98
Women	2·21
Children	4·91

The diseases are such as arise from sudden and considerable variations of temperature and malaria, and especially among the soldiers, aggravated by exposure to the sun and intemperance.

Dinapore.

In the Station of Dinapore the aspect of the Barracks being the reverse of what it should have been in respect to the prevailing winds, free perflation is prevented. The roof is flat and chunamed ; the length of each building is 800 feet, and width 20 feet ; there is a verandah on each side.

The masses of men, women, and children in these Barracks, is another cause of the unhealthiness experienced generally in them by the troops. There are no separate accommodations for the women and children. The doors and windows are jealousied.

The *cold* weather here was generally ushered in by severe hepatic and dysenteric affections. And in the *hot* season there were severe ardent fevers, very sudden in their operation, and often terminating in apoplexy.

In His Majesty's 13th Light Infantry for the period of two years, for 1830 and 1831 last, at Dinapore, the average proportion of deaths to strength was,

Officers.....	1·79 per cent per annum.
Men	3·84
Women.....	4·23
Children	12·37

The facility with which the men could obtain toddy, and deleterious liquors in excess, was one great source of disease and mortality, as also the difficulty of confining the men within bounds, there being no enclosure to the Barrack compound.

The 13th being a Light Infantry corps, their movements were more likely to expose them to profuse perspiration, and consequently to more frequent alterations of heat and cold, with the usual bad effects.

Boglipore.

In the Station of Boglipore the Barracks formerly occupied by His Majesty's 3rd Buffs, were merely a set of buildings erected temporarily in 1825 as stables for some Native Cavalry, and were very inimical to health.

Ghazeepore.

The Station of Ghazeepore appears to hold a middle station as to healthiness. The soil is readily permeable by the rain falling on its surface, which sinking down to a very considerable depth before it finds a hard bottom to detain it, is soon out of reach of superficial evaporation, and cannot afford the constant supply of moisture necessary in co-operation with other agents to produce the maturity of marsh miasmata. From the continuation of these circumstances it might *a priori* be thought that the Station possesses to a great degree an immunity from marsh miasmata.